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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,846	02/10/2004	Robert L. Ponziani	13-DV-132638	1072
7590	09/30/2005		EXAMINER	
General Electric Co. One Neumann Way, H17 Cincinnati, OH 45215			KIM, TAE JUN	
			ART UNIT	PAPER NUMBER
			3746	

DATE MAILED: 09/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/775,846	Applicant(s) PONZIANI ET AL.	
	Examiner Ted Kim	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7 and 9-23 is/are rejected.
- 7) ☒ Claim(s) 5, 6 and 8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>02/10/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Specification

1. Applicant is required to update the copending application information in the first paragraph of the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 23 is rejected under 35 U.S.C. 102(b) as being anticipated by Rothenbuhler (4,814,664). Rothenbuhler teaches an igniter [for a gas turbine engine is intended use], comprising: a) a first electrode 26 which changes in size (inherent) during operation; and b) a marker 43 (see col. 3, lines 14+) which becomes visible when a predetermined change in size occurs.
4. Claims 1-3, 9-12, 14, 15, 18, 19-21, 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Kumagai et al (4,284,054). Kumagai et al teach an igniter [for a gas turbine engine has been treated as intended use], comprising (see Fig. 11): a) a first electrode 51, 55 having a tip; b) a second electrode 54 which cooperates with the tip to generate a plasma; and c) a third electrode 57 having no exposure to the tip when the igniter is newly installed, but which develops exposure to the tip after a period of

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operation [inherent, as operation of the igniter for a sufficiently long period will erode the insulation, see the admitted prior art and also e.g. Rothenbuhler]; and further comprising:

d) an insulator 61 surrounding the first electrode; wherein the third electrode 57 is insulated from both the first 54 and second electrodes 51, 55; an igniter [for a gas turbine engine has been treated as intended use], comprising: a) a first electrode 54 having a tip; b) an insulator 61 surrounding the first electrode; c) a second electrode surrounding the insulator, and having an edge which cooperates with the tip to generate a plasma; and d) a third electrode 57 embedded in the insulator, having no part exposed to the first electrode 54; operation of the igniter causes part of the insulator to erode, thereby causing part of the third electrode to become exposed to the tip; an igniter [for a gas turbine engine has been treated as intended use], comprising: a) a first electrode 54; b) a second electrode 51, 55 which cooperates with the first electrode to generate a plasma; c) a third electrode 57; d) a barrier 61 between the third electrode and the first electrode which i) blocks auxiliary plasma formation between the first and third electrodes at a time T1, and ii) erodes after T1, to enable said auxiliary plasma formation [believed to be inherent, after sufficient erosion the high voltage on the attraction electrode will no longer be impeded by the insulation but allow for sparking to the ground electrode 51, 55]; an igniter [for a gas turbine engine has been treated as intended use], comprising: a) a first electrode 54, rod-like in configuration, coaxial with an axis; b) an insulator 61 surrounding the first electrode, except at a tip of the first electrode, where said tip is exposed; c) a second electrode 51, 55 generally cylindrical in configuration, coaxial with said axis, and

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surrounding the insulator and the first electrode; d) a third electrode 57 having a distal end, embedded in the insulator and completely surrounded by the insulator. A method of operating a fuel igniter in an engine, comprising: a) generating a first plasma near a first end of a first electrode 51, 55; b) maintaining a second electrode 57 having a second end; c) initially surrounding the second end with a solid insulation 61; and d) eroding the solid insulation (inherent, as address above), to expose the second end, and then generating a second plasma between the first and second electrodes (also [believed to be inherent, after sufficient erosion the high voltage on the attraction electrode will no longer be impeded by the insulation but allow for sparking to the ground electrode 51, 55].

Similarly, the igniter for a gas turbine engine, comprising: a) first and second electrodes which i) cooperate to generate a plasma; and ii) wherein plasma generation is accompanied by a change which inhibits later plasma generation; and b) a third electrode which i) becomes available with said change; and ii) cooperates with either the first or second electrode to generate a plasma; an igniter for a gas turbine engine, comprising: a) a first electrode; b) a second electrode which cooperates with the first electrode to generate a plasma; and c) a third electrode which i) is separated from the first electrode by an erodible shield; and ii) cooperates with the first electrode to generate a plasma when sufficient erosion of the shield occurs; the electrode 57 comprises a marker which indicates a predetermined amount of change of shape.

Claim Rejections - 35 USC § 103

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5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eaton et al (3,946,149) in view of Rothenbuhler (4,814,664). Eaton et al teach a center/first electrode 18 with an insert 21 within the electrode. Eaton shows in Fig. 4 the wear in the center electrode 18 of the nickel sheath (compare with e.g. Fig. 3 and see col. 3, lines 29+). Eaton et al do not teach a marker which becomes visible when a predetermined change in size occurs. Rothenbuhler teaches a marker 43 which becomes visible when a predetermined change in size occurs for a center electrode assembly to indicate when sufficient wear has occurred to require replacement of the igniter. It would have been obvious to one of ordinary skill in the art to employ a marker as an indicator of when igniter replacement is needed to facilitate maintenance. The admitted prior art teach that gas turbine spark igniters are old and well known in the art. It would have been obvious to one of ordinary skill in the art to employ a marker in a gas turbine engine to facilitate maintenance.

7. Claims 1-3, 7, 9-12, 14, 15, 18, 19-21, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumagai et al (4,284,054) in view of the admitted prior art and/or Rothenbuhler (4,814,664). The admitted prior art teach that gas turbine spark

igniters are old and well known in the art. Kumagai teach an attraction electrode embedded in the insulation facilitates lean burning with spark igniters, which is the standard burning process occurring in gas turbine engines due to emissions requirements. It would appear to be inherent that operation of the igniter for a sufficiently long period will erode the insulation. However, in order to obviate any doubt, the admitted prior art teach that this is the case and also Rothenbuhler teaches that the wear of the insulation occurs. It would also appear to be inherent that after sufficient wear the attraction electrode, will also create a spark/plasma due to the high voltages present, note that the voltage from line 37 on the attraction electrode 30 can be the same as that on the sparking electrode 21 (see Fig. 4). Hence, it is believed to be inherent, after sufficient erosion the high voltage on the attraction electrode will no longer be impeded by the insulation but allow for sparking to the ground electrode 51, 55. However, to obviate any doubt, it would have been obvious to one of ordinary skill in the art to vary the positioning of the embedded insulation sufficiently close to the ground electrode to allow attraction as part of the optimization process and/or as a matter of finding the workable positions in the art. Hence, at a sufficiently close positioning sparking will occur upon sufficient wear of the insulation. As for the engine being a gas turbine engine, it would have been obvious to one of ordinary skill in the art to employ the embedded electrode in the spark igniters for gas turbine engines to facilitate lean burning.

8. Claims 4, 13, 16, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumagai et al (4,284,054) in view of the admitted prior art and/or Rothenbuhler

(4,814,664) and further in view of Owens (5,508,618). The above applied art teach various aspects of the claimed invention but do not teach a detecting the current in the second/embedded electrode and issuing a signal in response. Owens teaches an igniter with a current detector 30 and a issued signal, where the detector can be located at the conductor 24 or even the igniter (see col. 3, lines 47+). It would have been obvious to one of ordinary skill in the art to employ a current detector, to monitor the status of the second/embedded electrode.

9. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumagai et al (4,284,054) in view of the admitted prior art and/or Rothenbuhler (4,814,664), as applied above, and further in view of either Andert (2,969,500) or Watanabe et al (4,914,344). The above applied art do not teach the embedded electrode is cylindrical. Andert teach a first electrode 33, a second cylindrical electrode 12, 35 and an cylindrical electrode 31 therebetween in the insulation 23. Watanabe et al teach a first electrode 1, a second cylindrical electrode 6 and an cylindrical electrode 4 therebetween. It would have been obvious to one of ordinary skill in the art to make the embedded electrode cylindrical as an equivalent electrode shape commonly used in the art.

Allowable Subject Matter

10. Claims 5, 6, 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information


Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are

571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>



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